Abstracts

Analysis of multiport waveguide structures by a higher-order FDTD methodology based on non-orthogonal curvilinear grids

N.V. Kantartzis, M. Gatzianas, T.I. Kosmanis and T.D. Tsiboukis. "Analysis of multiport waveguide structures by a higher-order FDTD methodology based on non-orthogonal curvilinear grids." 2001 MTT-S International Microwave Symposium Digest 01.3 (2001 Vol. III [MWSYM]): 2051-2054 vol.3.

A generalized methodology for the construction of nonstandard higher-order finite-difference time-domain schemes, as well as their application to complex electromagnetic problems in curvilinear non-orthogonal coordinate systems, are presented in this paper. As a consequence, a new class of low-dispersion operators is designed for the approximation of spatial and temporal derivatives. Their extension to curvilinear non-orthogonal coordinates is attained by a higher-order variation of the covariant and contravariant vector component theory, in which all metric terms are taken into account. Finally, the proposed method is validated by the analysis of diverse multiport microwave structures with realistic features.

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